Space Weather Forecast

Issued on Sunday, 24 July 2022 at 01:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: Ongoing risk of G1/Minor Storms from recent CME arrival. Slight Chance of R1/R2.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Low through the last 24 hours, with modest Common-class flare activity, the majority of this activity in the last 12 hours. The strongest flare was a C3.6 flare from a region which has recently rotated across the northwestern horizon. One region in the northwest quadrant has faded, with the remaining five regions all appearing stable and relatively inactive. Three CMEs (coronal mass ejections) have been analysed over the last 24 hours, with none of these adjudged to have an Earth-directed component. A further apparently Earth-directed CME has recently become discernible on satellite imagery, although a source region is not immediately obvious. A full analysis will be undertaken as soon as sufficient imagery is available.

Solar Wind / Geomagnetic Activity: The solar wind was under the influence of a fast solar wind and existed at elevated levels, but increased to strong levels early on 23 July due to the arrival of a CME which left the Sun on 21 July. The speed then declined back to elevated levels, before further perturbations later in the period, likely due to the CME. Total magnetic field strength increased from weak to strong levels due to the CME before declining, although a further slight increase was observed towards the end of the period. The north-south component started the period, weak, but then fluctuated moderately due to the onset of the CME. These fluctuations eased during the period, but then the north-south component became weakly, but persistently negative by the end of the period. The slight increase in these parameters may be due to a slightly denser portion of the CME. Geomagnetic activity, started Active, then increasing to G1/Minor Storm levels between 23/0300-0600 UTC due to the CME arrival. Conditions have been Quiet to Unsettled since that time.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Activity is expected to remain Low, with no significant or active regions on the visible disc.

Solar Wind / Geomagnetic Activity: The CME which arrived on 23 July is expected to affect the Earth through 24 and 25 July, especially in any sustained periods of sustained southward magnetic field A fast solar wind is also affecting the Earth, with this likely to decline by day 3 (26 July). No further features are currently forecast to affect the Earth. Geomagnetic activity is expected to be mainly Unsettled through day 1, but with a further risk of Active or G1/Minor Storm intervals in any sustained periods of southward magnetic field. A return to mainly Quiet, with isolated Unsettled periods is forecast from day 3 (26 July).

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2022. All Rights Reserved.

Geomagnetic Storms:

Geo-Magnetic Storm / Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	20	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares / Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	10	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms / Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2022. All Rights Reserved.